REMARKS/ARGUMENTS

These remarks are submitted in response to the Office Action of February 6, 2006 (Office Action). As this response is timely filed within the 3-month shortened statutory period, no fee is believed due. As a result of this amendment Claims 1, 3, 5-8, 10, 12, 14, and 17 have been amended and Claims 15 and 16 have been canceled. Claims 1-14 and 17-18 remain in the application.

In paragraph 2, page 2, of the Office Action, Claims 1-5 and 10-14 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Publication No. 2001/0045155 to Boudet *et al* (hereinafter Boudet). In paragraph 14, page 4, of the Office Action, Claims 6-9 and 15-18 were rejected under 35 U.S.C. 103(a) as being unpatentable over Boudet *et al* in view of U.S. Patent Application Publication No. 2004/0159217 to Holm *et al* (hereinafter Holm).

I. Applicants' Invention

It may be helpful to reiterate certain aspects of Applicants' invention prior to addressing the references cited in the Office Action. One embodiment of the invention, as typified by independent Claim 1, is a method of scaling polyphony. The method can include identifying music data, wherein the music data indicates instruments to be used and each instrument has an assigned priority, comparing a measure of polyphony needed to play the music data with polyphony of a sound generating device, if the measure of polyphony exceeds the polyphony of the sound generating device, playing the music data without using one or more instruments indicated by the music data according to the assigned priorities. For at least one instrument indicated by the music data, the method can further include comparing a sound quality rating of the instrument on the sound generating device with a threshold corresponding to the instrument, wherein the sound generating device specifies quality ratings for the instruments. If the quality rating of the instrument is less than the threshold, the method can include selecting a substitute

instrument having a quality rating that exceeds the threshold, wherein a substitution of a higher quality instrument is merited based upon a sound quality of N alternative instruments available to the sound generating device, and using the substitute instrument in place of the at least one instrument.

In particular, a sound quality for each of the instruments is stored on the sound generating device, with a list of N alternative instruments based on the instrument sound quality. The sound quality identifies which instruments sound better on the sound generating device.

II. The Claims Define Over the Prior Art

Boudet is directed to a method of compressing a MIDI file to a format 0. The format 0 file is then scanned to reduce the number of possible instruments. MIDI commands having no sound output are then eliminated and NoteOn and NoteOff commands are replaced by a PlayNote command. Based on the characteristics of an appliance that has to play the compressed file, the notes are re-centered in a bandwidth that is compatible with the appliance, after which the file is scanned to seek instances of polyphony. The characteristics of the appliance include the memory space, the computational processing requirements, and the bandwidth of the device. The method of compressing the MIDI file involves scanning the file to determine production requirements for generating the polyphony of the instruments. The method includes determining the consumed resources involved in the generation of the polyphony based on the characteristics of the device. Instruments can be eliminated based on instrument priorities to reduce the polyphony to a level acceptable by the reproduction means. The acceptable level is based on the characteristics of the device.

In contrast, Applicant's invention is directed to selecting instruments having a sound quality that is already established by the sound generating device. Instruments are ranked by sound quality in a table stored on the sound generating device. For example,

the sound quality of the instruments are previously established by the manufacturer of the sound generating device. Subsequently, a user can update the sound quality of each instrument based on a personal preference of the sound quality. The sound quality of an instrument is identified independent of a MIDI file. Whereas Boudet's invention evaluates the sound reproduction capabilities of the appliance by scanning a MIDI file to determine if the appliance can support sound production prior to rendering the music, Applicant's invention evaluates the sound quality of instruments available to the device during a rendering of the music, without reference to the sound production capabilities of the device. Namely, a sound quality is established for each instrument on a particular sound generating device. The sound generating device can then determine a priority of instruments based on the sound quality particular to the sound generating device.

The Examiner points out in [0051] of Boudet that notes are re-centered so that they are within the bandwidth of the selected appliance to meet a required sound quality of a sound set. However, this does not constitute evaluating a sound quality of an instrument. For example, in Boudet's invention, all notes which are below the bandwidth are replaced by notes from the lowest octave of the device that can be played. Clearly, Boudet is concerned with the capabilities of the device, and is not concerned with the quality of sound produced by notes outside the bandwidth due to these capabilities. It is certainly possible that the notes can be played outside the bandwidth though the quality of the sound may be compromised. As those skilled in the art can appreciate, the level of the note may change when played outside the bandwidth, but this does not reflect the overall quality of the instrument. Also, an instrument can produce resonant harmonics that may fall outside the bandwidth. For example, an electric guitar playing a middle C note at 440Hz may produce resonances at 640Hz and 800Hz due to the construction of the instrument. On the other hand, a slide guitar may produce resonances at lower frequencies. Boudet does not address concerns related to the sound quality of the instrument. Boudet simply evaluates the value of the note (440Hz) to determine where it

falls within a bandwidth, and only addresses a concern that the note will not be played as the composition expects at the frequency of the note because it will be re-centered. If Boudet were concerned with the quality of the sound produced by the device, Boudet's invention would attempt to synthesize the sound to determine the sound quality. Boudet does not even disclose, discuss, or suggest the act of synthesizing a sound to evaluate a quality of the sound produced by the device.

Moreover, Boudet scans the MIDI file to determine which notes fall outside a bandwidth. The scanning does not include music synthesis. One skilled in the art can presume that the bandwidth is represented by a low-frequency cutoff and a high-frequency cutoff, and the note can be evaluated based on a frequency of the note to determine if the note falls within the bandwidth. However, Boudet is silent as to whether the quality of the note changes with regard to the bandwidth. It is clearly possible, that the note, even when falling within the bandwidth, can change in sound quality. Boudet nor Holm address this concern. For example, various sound generating devices have bandwidths curves that may take on different shapes such as those having a single hump, a skewed curve, a tilted spectrum, a double hump, or the like. Boudet is silent as to how the shape of the bandwidth affects the sound quality, and Boudet does not disclose any other means of re-centering the note based on this information. Accordingly, Boudet does not even contemplate the effects of sound quality based on the bandwidth. Boudet is clearly concerned only with re-centering the note when the note falls outside a bandwidth. This is the extent to which Boudet addresses sound reproduction quality.

Moreover, Boudet's invention scans the MIDI file. The method scans for events in the MIDI file to determine which notes exceed the bandwidth before the notes are played. That is, the appliance is not performing the elimination of the instruments in real-time while the MIDI composition is being rendered. Boudet is concerned with compression and this occurs in non-real time. Applicant's invention is not concerned with compression, or eliminating instruments due to appliance capabilities such as processing

requirements, memory, and bandwidth. Applicant's invention is concerned with identifying instruments having a sound quality that is acceptable on the sound generating device, and prioritizing instrument selection based on the sound quality assigned by the sound generating device. The prioritization of sound quality is not the same as prioritization of an instrument. Applicant's invention is directed to determining whether a better sounding instrument alternative exists (See Applicant's Specification Pg. 8, Paragraph [0031]).

Applicant's respectfully argue that a primary point of novelty of Applicant's invention lies in establishing the sound quality of instruments on a sound generating device and selecting instruments based on the sound quality. In response to the Office Action, Claims 6 and 7, which address a determination of an instrument's sound quality exceeding a threshold, have been incorporated into Claim 1, and amended to recite the dependence of the sound quality rating on the sound generating device. Claims 6 has been amended to specify or clarify the synthesized nature of data being compared and Claim 7 has been amended to recite the comparison of quality ratings of instruments on a composition by composition basis. Similarly, Claims 15 and 16 have been incorporated in Claim 10. Claims 8 and 17 have also been amended to emphasize sound quality aspects of an instrument particular to a sound generating device. Accordingly, Applicant's herein address the rejections on Page 4 of the Office Action with regard to Claim 6 and 8. The Examiner points out that original Claim 6 was rejected under 35 U.S.C. 103(a) as being unpatentable over Boudet et al. in view of Holm et al. as previously noted. Holm is concerned with allocating portions of a computational load for MIDI synthesis to one or more sources. For example, three mobile devices within a room can partition a MIDI sequence of note events for rendering a music layer on each device. That is, each mobile device will render a part of the MIDI music. Holm teaches allocating MIDI channels between the sources for reducing the computational load between the sources based on the capabilities of the device. However, Holm's does not teach substituting of instruments

to meet a sound quality of an instrument on a device based on a list of instrument sound qualities particular to the device.

The Examiner contends that Holm teaches a substituting of instruments to meet a required quality of a sound set (see page 3, paragraph [0035]), and that Holm teaches this idea of scalable polyphony in order to gain the best sound quality with the memory and resources available. Applicant's agree that Holm teaches providing the best sound quality based on the memory and resources available. Holm addresses a problem similar in scope to that of Boudet. Namely, how to allocate instruments to comply with the resources of a device; such as processing load, memory, and bandwidth. However, Holm like Boudet, does not teach providing the best sound quality based on a sound quality of an instrument that has been previously rated by the sound generating device, or a user. Holm does not address a level of quality which is compromised based on the resources of the device. Holm simply eliminates an instrument based on the sound generating notation of a MIDI music file. In particular, notes of the MIDI file are not synthesized to determine the instrument's effect on sound quality. Holm simply teaches selecting instruments based on a capacity or capability of the device to render the music composition without actually synthesizing the sound produced by the instrument eliminated. In contrast, Applicant's invention selects instruments based on a sound quality of the instrument that is already established by the device, for example, during manufacturing. Again, Applicant's invention departs in scope from Boudet and Holm, in that Applicant's invention synthesizes the sound of an instrument to determine the sound quality. Accordingly, it would not be obvious to one skilled in the art to modify Holm's invention to incorporate the ideas taught by Holm et al. into the invention of Boudet et al.

Applicants respectfully assert, therefore, that the cited references individually and combined fail to teach or suggest each feature of amended independent Claims 1, 3, 5, 8, 10, 12, 14 and 17, and that the claims thus define over the prior art. Applicants, moreover, respectfully assert that whereas the remaining claims each depend from one of

the amended independent claims, the dependent claims likewise define over the prior art. In light of the foregoing, withdrawal of the 35 U.S.C 102(b) with respect to Claims 1, 3, 5, 10, 12, and 14 as amended is respectfully requested. Since Holm also fails to explicitly or implicitly teach each claimed limitation of claims 8 and 17 as amended, withdrawal of the 35 U.S.C 103(a) is requested.

CONCLUSION

Applicants believe that this application is now in full condition for allowance, which action is respectfully requested. Applicants request that the Examiner call the undersigned if clarification is needed on any matter within this Amendment, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

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